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IS 13137 (2003): Textiles - Tyre Cord Warp-Sheet Polyamide, Dipped [TXD 33: Industrial Fabrics]

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(पहला पुनरीक्षण)

Indian Standard

TEXTILES — TYRE CORD WARP-SHEET POLYAMIDE, DIPPED — SPECIFICATION

(First Revision)

ICS 59.060.20; 59.080.20; 83.160

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BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

December 2003

Price Group 2

Geotextiles and Industrial Fabrics Sectional Committee, TX 30

FOREWORD

This Indian Standard (First Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Geotextiles and Industrial Fabrics Sectional Committee had been approved by the Textile Division Council.

In this standard some of the existing varieties of dipped polyamide tyre cords have been rationalized while two new varieties have been included.

IS 11926 : 1987 'Specification for polyamide tyre cord warp-sheet for automotive tyres' covers the requirements of polyamide tyre cord warp-sheet in undipped stage.

There is no International Standard on the subject.

The composition of the Committee responsible for formulation of this standard is given in Annex B.

For the purpose of deciding whether a particular requirement of this standard is complied with the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

TEXTILES – TYRE CORD WARP-SHEET POLYAMIDE, DIPPED — SPECIFICATION

(First Revision)

1 SCOPE

The standard prescribes the requirement of seven varieties of dipped polyamide tyre cord warp-sheet for the manufacture of automotive tyres.

2 REFERENCES

The standards given in Annex A contain provisions which through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of standards indicated in Annex A.

3 TERMINOLOGY

For the purpose of this standard, the following definitions in addition to those given in IS 4910 (Part 1) shall apply.

3.1 Tyre Cord

A particular construction of dipped filaments of polyamide used as the structural reinforcement of pneumatic tyres.

3.2 Tyre Cord Warp-Sheet

A planner textile structure consisting of tyre cords with widely spaced weft threads. The latter merely serves to hold the cords in position for further processing.

4 MANUFACTURE

4.1 Tyre Cords

Tyre cords shall be manufactured out of continuous filament yarn of nylon 6 or nylon 6.6. The cords shall be evenly twisted and reasonably free from defects such as cable knots, slubs, corkscrews, kinks, broken filaments, oil stains and other extraneous material which may affect the serviceability of the warp-sheet.

4.1.1 The maximum number of joints for a particular length of cord shall be as agreed to between the buyer and the seller. Cord joints shall be sewn spliced or air spliced in such a manner so as to obtain at least 85 percent of the breaking load value (specified for the cord) at the joined portion.

4.2 Weft Yarn

The weft yarn used in the manufacture of warp-sheet shall be made out of a cotton or any other suitable fibre or blends thereof with the linear density ranging approximately from 14 to 30 tex (20s to 40s count).

4.3 Warp-Sheet

The warp-sheet is woven with the required number of cords per decimetre and dipped in resorcinal formaldehyde latex (RFL) dip solution. In this process, the warp-sheet is subjected to other treatments such as drying, stretching, heat-setting, etc.

4.4 Tabs (or Header)

These shall be provided at each end of the warp-sheet roll and also at intermediate positions in the roll as agreed to between the buyer and the seller.

4.5 Tabby

One test tabby shall be provided for each creel load or for a suitable number of rolls as agreed to between the buyer and the seller.

5 REQUIREMENT

5.1 Tyre Cords

Cords of different varieties used in warp-sheet shall conform to the requirements given in Table 1.

5.2 Constructional Particulars of Warp-Sheet

The constructional particulars of warp-sheet, namely, total number of ends, ends/dm, picks/dm, fibre used for weft yarn, linear density of weft, roll length, width and mass shall be as agreed to between the buyer and the seller subject to the following tolerances when tested as per the test method indicated against corresponding characteristics:

Sl No.	*Characteristic*	*Tolerance*	*Method of Test, Ref to*
(1)	(2)	(3)	(4)
i)	Ends/dm	± 1.00 percent	IS 1963
ii)	Picks/dm	± 10 percent	IS 1963
iii)	Width	± 2.0 cm on agreed width	IS 1954
iv)	Mass, g/m^2	± 3 percent	IS 1964
v)	Total number of warp ends	As declared or as specified	—

Table 1 Requirement for Dipped Polyamide Tyre Cords for Warp-Sheets

(*Clause* 5.1)

Variety No.	Linear Density of Yarn, Tex	No. of Plies	Linear Density of Dipped Cord, Tex	Twist per Metre		Breaking Strength, at 25 cm Test Length, *Min, N*	Elongation, Percent at				
				Ply (Z-Twist)	Cable (S-Twist)		Predetermined Load				Breaking Load, *Min*
							45*N*	70*N*	90*N*	110*N*	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
1	94	2	210	500	500	130	9	—	—	—	20
2	94	1	105	280	—	60	14	—	—	—	16
3	140	2	318	400	400	200	—	9	—	—	20
4	140	3	480	300	300	295	—	—	—	9	20
5	140	1	150	235	—	90	11	—	—	—	18
6	188	2	420	350	350	265	—	—	9	—	20
7	210	2	480	300	300	295	—	—	—	9	20
Tolerance percent	—	—	±3	±6	±6	—	±1.5	±1.5	±1.5	±1.5	
Method of test	—	—	IS 4910 (Part 2)	← IS 832 →		← IS 4910 (Part 3) →					

5.3 Other Requirements

The requirements of dip pick up, heat shrinkage and heat shrinkage force, heat degradation, creep and adhesion characteristics shall be as agreed to between the buyer and the seller.

5.3.1 In order to determine the conformity of cords to these requirements, IS 4910 (Part 4), IS 4910 (Part 5), IS 4910 (Part 7), IS 4910(Part 10) and IS 4910 (Part 13) respectively, shall be followed.

6 PACKING

Unless otherwise agreed to between the buyer and the seller, the tyre cord warp-sheet shall be packed as detailed in **6.1**.

6.1 Warp-sheet shall be wound evenly and tightly on to a roller of suitable dimensions. The roll shall be covered with atleast one layer of black polyethylene of minimum 40 micron thickness (*see* IS 2508) to avoid exposure to sunlight and finally wrapped in one layer of hessian cloth conforming to Type 1 of IS 2818 (Part 2) or any other sacking cloth. Discs of suitable size shall be applied at the roll ends and the final wrapping layer of hessian/sacking cloth shall be securely sewn in order to protect the roll from contamination of moisture or physical damage.

7 MARKING

Each roll shall be marked with the following:

a) Variety number,
b) Date of manufacture,
c) Length of roll,
d) Mass, and
e) Indication of the source of manufacture.

7.1 BIS Certification Marking

Each roll may also be marked with the Standard Mark.

7.1.1 The use of the Standard Mark is governed by the provisions of the *Bureau of Indian Standards Act*, 1986 and the Rules and Regulations made thereunder. The details of conditions under which the license for the use of Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

8 SAMPLING

The sampling and criteria for conformity of tyre cords warp-sheet shall be as prescribed in IS 4910 (Part 12).

ANNEX A

(*Clause* 2.1)

LIST OF REFERRED INDIAN STANDARDS

IS No.	*Title*
832 : 1985	Methods for determination of twist in yarn (*first revision*)
1954 : 1990	Determination of length and width of woven fabrics — Methods (*second revision*)
1963 : 1981	Methods for determination of threads per unit length in woven fabrics (*second revision*)
1964 : 2001	Textiles — Methods for determination of mass per unit length and mass per unit area of fabrics (*second revision*)
2508 : 1984	Low density polyethylene films (*second revision*)
2818 (Part 2) : 1971	Indian hessian: Part 2 305 and 299 g/m^2 at 16 percent contract regain (*first revision*)
4910	Methods of test for tyre yarns, cords and tyre cord warp-sheets made from man-made fibres:
(Part 1) : 1989	Definition of terms (*first revision*)
(Part 2) : 1989	Linear density (*first revision*)
(Part 3) : 1989	Breaking load, elongation at break and tenacity (*first revision*)
(Part 4) : 1989	Dip pick up (*first revision*)
(Part 5) : 1989	Heat shrinkage and heat shrinkage force (*first revision*)
(Part 7) : 1989	Heat degradation (*first revision*)
(Part 10) : 1989	Creep (*first revision*)
(Part 12) : 1989	Sampling for tyre yarns, cords and tyre cord fabrics made from polyamide
(Part 13) : 1989	Static adhesion of textile tyre cord to vulcanized rubber

ANNEX B

(*Foreword*)

COMMITTEE COMPOSITION

Geotextiles and Industrial Fabrics Sectional Committee, TX 30

Organization	*Representative(s)*
The Bombay Textile Research Association, Mumbai	Dr A. N. Desai (***Chairman***)
AIMIL Pvt Limited, New Delhi	Shri M. D. Nair Shri J. C. Baveja (*Alternate*)
Bengal Waterproof Ltd, Kolkata	Shri B. Banerjee
Central Road Research Institute, New Delhi	Shri O. P. Yadav Shri Jai Bhagwan (*Alternate*)
Charminar Nonwovens Ltd, Hyderabad	Representative
Coir Board, Kochi	Shri M. Kumaraswamy Pillay
Directorate General of Supplies & Disposals, New Delhi	Shri A. K. Sehgal Shri Sunder Lal (*Alternate*)
Gujarat Engineering Research Institute, Vadodara	Dr U. D. Datir, Shri H. P. Pandya (*Alternate*)
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The Synthetics & Art Silk Mills Research Association, Mumbai	Dr A. K. Rakshit
Veermata Jijabai Technological Institute, Mumbai	Shri M. H. Bhavsar Dr (Mrs) S. S. Doke (*Alternate*)
BIS Directorate General	Shri P. Bhatnagar, Director & Head (TXD) [Representing Director General (*Ex-officio*)]

Member Secretary
Shri Anil Kumar
Joint Director (TXD), BIS

Bureau of Indian Standards

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BUREAU OF INDIAN STANDARDS

Headquarters :

Manak Bhavan, 9 Bahadur Shah Zafar Marg, New Delhi 110 002
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